REMARKS

Applicants respectfully requests reconsideration of this application as amended. Claims 1-19 are pending in the application. Claims 1-19 are rejected.

Rejections under 35 USC § 112

The Final Office Action mailed December 1, 2006 rejects Claims 6-10, 12-15 and 17-19 under 35 USC § 112, second paragraph for allegedly being indefinite.

With regard to Claims 6, 12 and 17, respectively, the Examiner states that the terms "implication structure," "structure of the first property," and "logical structure of the first property" are not clearly described in the specification.

The present specification has been amended (i.e. on p. 16, lines 9-23,) in accordance with the Examiner's suggestions, to more clearly point out illustrative examples of the claimed subject matter. No new matter has been added.

Therefore, Applicant respectfully request the Examiner withdraw the rejection of Claims 6-10, 12-15 and 17-19 under 35 USC § 112, second paragraph.

Rejections under 35 USC § 102 (b)

The Final Office Action rejects Claims 1-5, 11 and 16 under 35 USC § 102 (b) as allegedly being anticipated by M. Chiodo et al., "Automatic Compositional Minimization in CTL Model Checking," Nov. 1992, pp. 172-178 (Chiodo).

Appellant submits that in order for a rejection based on anticipation to be maintained, the identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Claim 1, for example, sets forth:

1. A computer software product for formal verification of circuits or other finite-state systems, the computer software product having one or more recordable medium having executable instructions stored thereon which, when executed by a processing device, causes the processing device to:
   generate, from a first property, a first assumption including a first state predicate;
   generate, for a model, a first transition relation that includes the first state predicate; and
   reduce the first transition relation according to the first assumption.

In the Final Office Action, the Examiner states (p. 8, par. 20) that the claimed generation by a processing device, from a first property, of a first assumption including a first state predicate allegedly corresponds to a *compositional verification* method, Chiodo describes as where "one tries to deduce properties of a composition of processes by reasoning on the individual components and their interactions without ever building the composed system." (Chiodo, p. 172, Introduction, par. 2).

The examples given by Chiodo for this category, are: Wolper, who inductively verifies systems by looking for invariants; Kurshan and McMillan, who attempted a similar approach; and Grumberg, who defines subsets of the logics where only universal path quantification is allowed. (p. 172, Introduction, par. 3). These examples are apparently deductions of properties by human reasoning on components without building the composed system.

On the other hand, the present specification has disclosed generation by a processing device, from a first property, of a first assumption including a first state predicate, for example (Figs. 5b & 5c; pp. 17-18) as:

Given a parsing of the property, assumptions may be generated for the sup-properties to be evaluated.

Figure 5b illustrates one embodiment of a method for producing and propagating assumptions from sub-properties to be evaluated. In processing block 521, the assumption for iteration zero, $Assum_0$, is initialized to the value one (true) and Node is set to the root 500 of the property to be evaluated. The iteration counter i is then incremented and processing proceeds to processing block 522. In processing block 522, the Node is tested to see if it consists of a single variable, in which case processing terminates at processing block 522. If not, processing proceeds to processing block 523. In processing block 523 the type of the Node operation is identified. If it is an implication operation processing proceeds at processing block 524. On the other hand, if it is a next state operator X, then processing proceeds to processing block 525.

In processing block 524 the assumption for iteration i, $Assum_i$, is set to the assumption for iteration i-1, $Assum_{i-1}$, combined with the left sub-property of Node using the logical AND operation. In processing block 525 the assumption for iteration i, $Assum_i$, is set to post-image of the assumption for iteration i-1, $Assum_{i-1}$. Processing then proceeds to processing block 526

from processing block 524 or from processing block 525, where Node is set to the right sub-property of Node. The iteration counter i is then incremented and processing proceeds to processing block 522.

FIG. 5b

Set Node to the root.
Set $Assum_0$ to 1
Set i to 1. — 521

Is Node singular? — 522

yes → Done
Proceed to
711

no

Type of Node is — 523

$\Rightarrow$ Node — 524

X node — 525

Set $Assum_i$ to
$Assum_{i-1} \wedge Left(Node))$ — 524

Set $Assum_i$ to
$Post(Assum_{i-1})$ — 525

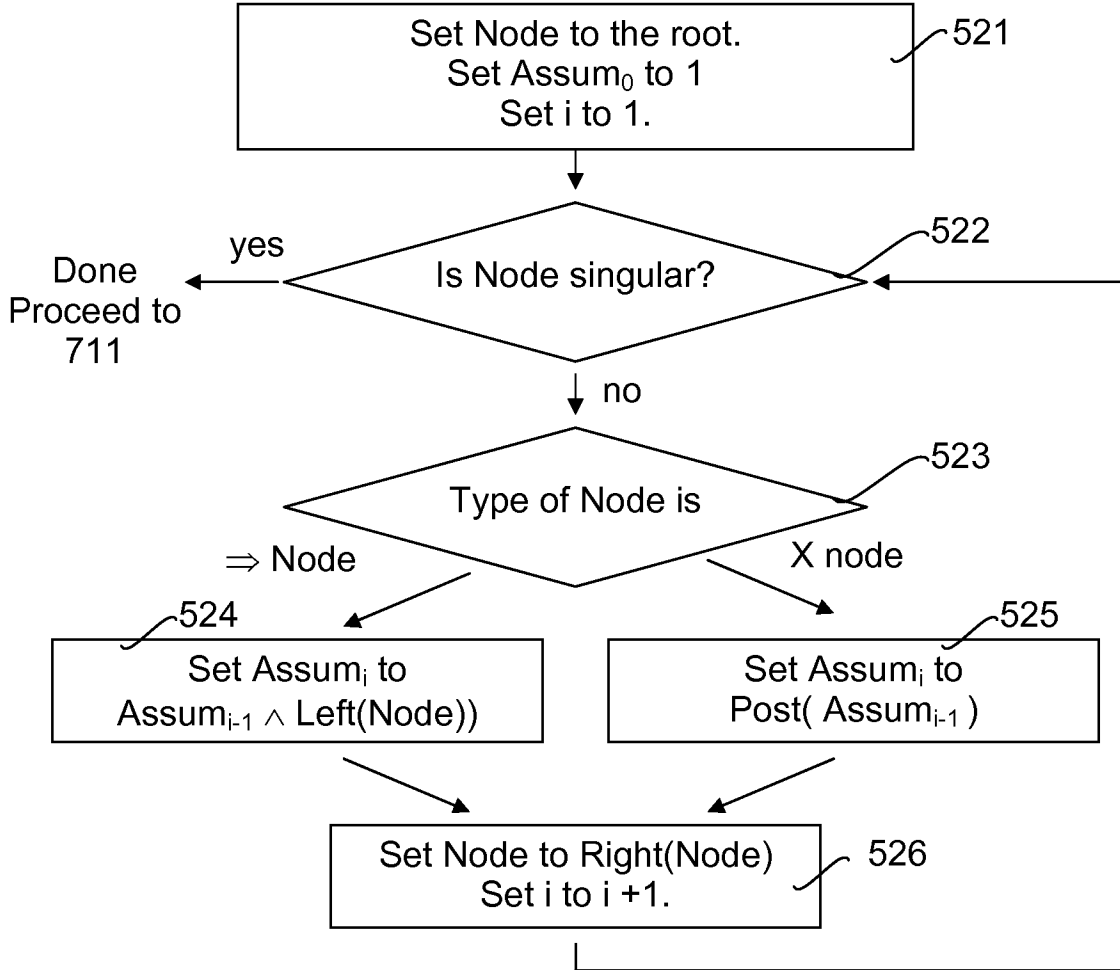Set Node to Right(Node)
Set i to i +1. — 526

Figure 5c shows an example of producing and propagating assumptions from sub-properties to be evaluated. In iteration zero, assumption 540 is set to the value one and sub-property 530 is set to the state predicate for property to be evaluated (a $\Rightarrow$ (b $\Rightarrow$ X(Xf))). In iteration one, assumption 541 is set to a.=.(1 AND a) in accordance with processing block 524 and sub-property 531 is set to the right sub-property of sub-property 530, b $\Rightarrow$ X(Xf) in accordance with processing block 526. In iteration two, assumption 542 is set to a AND b and sub-property 532 is set to the right sub-property of sub-property 531, X(Xf). In iteration three, assumption 543 is set to Post(a AND b), which may be evaluated as d since N(d) = b,.and sub-property 533 is set to the right sub-property of sub-property 532, Xf. In iteration four, assumption 544 is set to Post(Post(a.AND.b).which may be evaluated to one (true) and sub-property 534 is set to the right sub-property of sub-property 533, f.

The number of variables in a transition relation may be reduced according to a dynamically generated assumption as the transition relation is built. For instance the next state function for a variable f, N(f) = c NAND d may be pruned according to an assumption including (d=1) to N(f) = NOT c.

Applicant respectfully submits that the claim language must be construed through the eyes of a person of ordinary skill in the art who is deemed to read the claim in the context of the entire patent, including the specification.

It was explained recently in *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313; 75 U.S.P.Q.2D (BNA) 1321 (Fed. Cir. 2005): Importantly, the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.

See also *Medrad, Inc. v. MRI Devices Corp.*, 401 F.3d 1313, 1319 (Fed. Cir. 2005) ("We cannot look at the ordinary meaning of the term . . . in a vacuum. Rather, we must look at the ordinary meaning in the context of the written description and the prosecution history."); *V-Formation, Inc. v. Benetton Group SpA,* 401 F.3d 1307, 1310 (Fed. Cir. 2005) (intrinsic record "usually provides the technological and temporal context to enable the court to ascertain the meaning of the claim to one of ordinary skill in the art at the time of the invention"); *Unitherm Food Sys., Inc. v. Swift-Eckrich, Inc.,* 375 F.3d 1341, 1351."

See also *Research Plastics, Inc. v. Fed. Packaging Corp.*, 421 F.3d 1290, 1295 (Fed. Cir. 2005) ("Claim construction begins with the language of the claims. *Vitronics Corp. v. Conceptronic Inc.*, 90 F.ed 1576, 1582 (Fed. Cir. 1996). The words of a claim are generally to be accorded their "ordinary and customary meaning," id. at 1582, which is "the meaning that term would have to a person of ordinary skill in the art in question at the time of invention,") also citing *Phillips*, 2005 U.S. App. LEXIS 13954, at *22 ("It is presumed that the person of ordinary skill in the art read the claim in the context of the entire patent, including the specification, not confining his understanding to the claim at issue.").

Therefore, Applicant respectfully submits that, Chiodo does not disclose generating or producing a first assumption from a first property by a processing device in

as complete detail as is set forth in Claims 1, 11, and 16. But rather, Chiodo discloses, in the cited section, deductions of properties by human reasoning on components without ever building the composed system.

The Examiner further indicates that the claimed subject matter of reducing the first transition relation according to the first assumption as set forth in Claims 1 and 16, and of producing a reduced next state function from a first next state function involving the first state predicate by applying the first assumption as set forth in Claim 11, corresponds (in contrast) to their *compositional minimization* method (p. 173, lines 4-6), where Chiodo describes that they "extract the 'interesting' part of each component to yield a 'reduced' transition relation for each component" (p. 175, §3.2, par. 3-4).

Chiodo admits that prior proposed methods can be split into two categories, *compositional verification* and *compositional minimization* and that their approach falls into the second category (p. 172, Introduction, par. 2; p. 173, lines 4-6). Therefore, Chiodo does not deduce properties of a composition of processes by reasoning on the individual components and their interactions as in *compositional verification* (allegedly the claimed first assumption) in order to reduce their transition relation, but instead uses a *restrict operator* as a heuristic and hopes that the BDD size of the product of reduced machines will be smaller than the complete product machine. (p. 175, §§3.2.2, lines 12-17).

Therefore, Applicant respectfully submits that, Chiodo does not disclose generating or producing a first assumption from a first property by a processing device as set forth in Claims 1, 11, and 16 and reducing the first transition relation according to the first assumption as set forth in Claims 1 and 16, or producing a reduced next state function from a first next state function involving the first state predicate by applying the first assumption as set forth in Claim 11 in as complete detail as is set forth in Claims 1, 11, and 16.

Accordingly, Applicant believes that Claims 1-5, 11 and 16 are presently in condition for allowance and such action is earnestly solicited.

CONCLUSION

Applicant respectfully submits the present claims for allowance. If the Examiner believes a telephone conference would expedite or assist in the allowance of the present application, the Examiner is invited to call Lawrence Mennemeier at (408) 765-2194.

Authorization is hereby given to charge our Deposit Account No. 50-0221 for any charges that may be due.

Respectfully submitted,

Date: June 1, 2007   /s/Lawrence M. Mennemeier/
Lawrence M. Mennemeier
Reg. No. 51,003

INTEL CORPORATION
c/o INTELLEVATE LLP
P.O. Box 52050
Minneapolis, MN 55402
(408) 765-2194